REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendment and in light of the following discussion, is respectfully requested.

Claims 1-4, 8-18, 20, 32-39, 46-49, 51-57, 59-62, 65, and 66 are pending in the application with Claims 2-4, 9-12, 16-18, 20, 32-36, and 46-49 withdrawn from consideration. Claim 61 is currently amended. Support for amended Claim 61 can be found in the published application at paragraph [0073], for example. No new matter is introduced.

In the outstanding Office Action, Claims 8 and 51-53 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 1, 13-15, 37-39, 54-57, 59-62, 65, and 66 were rejected under 35 U.S.C. § 112, second paragraph, as incomplete for omitting essential elements. Claim 61 was rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Claims 1, 8, 13, 14, 37-39, 52-54, 56, 59, 60, 62, and 65 were rejected under 35 U.S.C. § 102(b) as anticipated by Vartanian (U.S. Patent No. 5,059,494). Claims 1, 8, 13-15, 51-54, 56, 59, 60, 61, 62, and 65 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jörissen (WO 00/63993) in view of Boneberg (U.S. Patent No. 6,696,188). Claims 37-39 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jörissen in view of Boneberg and Shabaker (U.S. Patent No. 2,850,038). Claims 15, 51, and 66 were rejected under 35 U.S.C. § 103(a) as unpatentable over Vartanian in view of Hallum (U.S. Patent No. 6,455,181). Claims 55 and 57 were rejected under 35 U.S.C. § 103(a) as unpatentable over Vartanian in view of Rusta-Sellehy (U.S. 2003/0091879).

Applicants respectfully traverse the rejection of the claims under 35 U.S.C. § 112 (1). M.P.E.P. § 2163(I) states: "to satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor *had possession of the claimed invention.*[1] M.P.E.P.

[1] See also *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991), emphasis added.

§ 2163(I) continues stating, "an applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, *figures*, diagrams, and formulas that fully set forth the claimed invention."[2] Applied to the present application, the specification as originally filed recites "hydrogen gas that has been discharged from shut value 414 flows through the exhaust flow passage 407, is delivered to oxygen-off gas exhaust flow passage 503."[3] The specification as originally filed continues that the gas that has been mixed in the mixing portion 411 flows into the combustor 510 and is subsequently discharged to the atmosphere.[4] One of ordinary skill in the art would recognize that in view of the original disclosure, Applicants were in possession of the invention as now claimed. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 112(1) be withdrawn.

Applicants respectfully traverse the rejection of the claims under 35 U.S.C. § 112(2) as being incomplete for omitting essential elements. Initially, it is unclear whether the Office Action intends to reject the claims under 35 U.S.C. § 112, first paragraph or second paragraph, as the rejection appears to combine elements of both. M.P.E.P. § 2172.01 states "a claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may be rejected under 35 U.S.C. § 112, *first paragraph, as not enabling*.[5] Further, "a claim which fails to interrelate essential elements of the invention as defined by applicants in the specification may be rejected under 35 U.S.C. § 112, *second paragraph, for failing to point out and distinctly claim the invention*.[6] Fundamental to both inquiries under 35 U.S.C. § 112, is whether matter is disclosed to be **essential** to the invention **by Applicant**. The Office Action has not indicated where in the

[2] Quoting *Lockwood v. American Airlines Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997), emphasis added.
[3] See the published application at paragraph [0058] referring to Figure 1.
[4] See paragraphs [0059]-[0060] referring to Figure 1.
[5] Quoting *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976), emphasis added.
[6] See *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976).

specification as originally filed or any other statement of record that would show that Applicants have *specifically indicated* that the feature of "a device that is controlled by the control portion to control feeding of the oxygen-off gas" is *essential* to the invention. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 112(2) "as being incomplete for omitting essential elements" be withdrawn.

With regard to the rejection of Claim 61 under 35 U.S.C. § 112(2) as being indefinite, amended Claim 61 recites: "the control portion opens the valve when an output of the compressor is higher than a predetermined *value*." Accordingly, Applicants respectfully request that the rejection of Claim 61 under 35 U.S.C. § 112(2) as indefinite be withdrawn.

Applicants respectfully traverse the rejection of independent Claims 1, 8, and 51-53 as anticipated by Vartanian. Claim 1 recites, among other features, a control portion that controls feeding that hydrogen-off gas and oxygen-off gas to a mixing portion so that a proportion of hydrogen-off gas fed to the mixing portion is *sufficiently diluted* in the mixing portion such that a *mixture exiting the mixing portion avoids ignition*. In contrast, Figure 1 of Vartanian illustrates a fuel flow control valve 5 and an air flow control valve 11 respectively provided upstream of a fuel cell 1.[7] Vartanian then describes "gases leaving the anode and the cathode are supplied separately to a burner 15 and used as a *heat source* for the fuel reforming reaction."[8]

Vartanian does not suggest or disclose the recited control portion of Claim 1. In particular, the **burner** of Vartanian is supplied cathode and anode exhaust gases in a quantity and ratio sufficient for burning and producing heat. In contrast, Claim 1 recites a control portion that controls feeding of hydrogen-off gas and oxygen-off gas to the mixing portion so that a proportion of hydrogen-off gas is sufficiently **diluted** in the mixing portion such that **a mixture exiting the mixing portion avoids ignition**. No only does Vartanian fail to suggest

[7] See Vartanian at column 2, lines 55-58.
[8] See Vartanian at column 2, lines 59-61, emphasis added.

or disclose the recited, but the burner of Vartanian in fact teaches away from the recited control portion that **dilutes** the hydrogen-off gas.

Based on the foregoing, Vartanian does not suggest or disclose all of the features of Claim 1 and in fact teaches away from those features. Independent Claims 8 and 52 each recite a control portion that controls the hydrogen-off gas to be sufficiently diluted in the mixing portion such that in mixture exiting the mixing portion avoids ignition. For the reasons discussed above, Vartanian does not suggest or disclose all of the features of Claims 8 or 52.

Claims 51 and 53 describe the feature of the control portion that includes a means for opening the valve if the concentration of hydrogen in the discharge hydrogen-off gas drops below a reference concentration such that hydrogen-off gas passes through the valve and exits the onboard fuel cell system in response to a determination that the concentration of hydrogen in the discharge hydrogen-off gas is below the reference concentration. Vartanian is silent with regard to this feature. Vartanian merely describes that anode and cathode exhaust gases are supplied separately to a burner 15 and used as a heat source.

The Office Action points to controller 6a to teach the above feature. However, Vartanian merely describes that valves 24 and 26 are modulated by controller 6a to maintain the **cross cell pressure difference**. Modulating valves to control a pressure difference is not equivalent to opening a valve in response to a determination that the concentration of hydrogen in the discharge hydrogen-off gas is below a reference concentration. As Vartanian does not suggest or disclose every limitation of the claimed invention either explicitly or inherently, Applicants respectfully request that the rejection of Claims 51 and 53 as anticipated by Vartanian be withdrawn. [9]

[9] See also *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997).

Applicants respectfully traverse the rejection of the independent claims as unpatentable over Jörissen in view of Boneberg. As described above, Claims 1, 8, and 52 each recite the feature of a control portion that controls a proportion of the hydrogen-off gas fed to the mixing portion such that the hydrogen-off gas is **sufficiently diluted** in the mixing portion such that a **mixture exiting the mixing portion avoids ignition**. As acknowledged by the Office Action, Jörissen does not suggest or disclose mixing the cathode and anode off-gases and accordingly Boneberg is applied to cure this deficiency.

Figure 1 of Boneberg illustrates a mixing device 4 which is supplied with the exhaust gases from the anode region and the cathode region of the fuel cell.[10] As illustrated in Figure 1, the combined gases then flow to the thermal burner 3 in which all substances which are present in the exhaust gases are at least "almost completely burnt."[11] Boneberg continues that after burning the exhaust gas the exhaust gas, flows to heat exchangers 1 and 5 in which the thermal energy present in the exhaust gases is used for heating, evaporating and/or superheating media.[12] Accordingly, Boneberg describes a thermal burner which burns the exhaust gases in order to *extract thermal energy* via heat exchangers 1 and 5.

Based on the foregoing, Boneberg does not suggest or disclose a control portion that control feeding of hydrogen-off gas to a mixing portion so that they hydrogen-off gas is **sufficiently diluted** such that **a mixture exiting the mixing portion avoids ignition**. In fact, Boneberg teaches away from this feature, in that Boneberg mixes the anode and cathode exhaust gases for the expressed purpose of igniting and burning the gases in order to extract thermal energy by the heat exchangers. Accordingly, Applicants respectfully submit that Boneberg does not suggest or disclose the recited control portion that controls feeding of

[10] See Boneberg at column 3, lines 32-36.
[11] See Boneberg at column 3, lines 60-67.
[12] See Boneberg at column 4, lines 15-21.

hydrogen-off gas and oxygen-off gas to the mixing portion as recited in Claims 1, 8 and 52. Moreover, as Jörissen is silent with regard to mixing the cathode and anode off gases.

Based on the foregoing, even the combined teachings of Jörissen and Boneberg do not suggest or disclose all of the features of independent Claims 1, 8 and 52. Moreover, the other cited references fail to cure the deficiencies of Jörissen and Boneberg. Accordingly, Applicants respectfully submit that Claims 1, 8, and 52 are in condition for Allowance.

As discussed above, independent Claims 51-53 recite a means for opening the valve if the concentration of hydrogen in the discharge hydrogen-off gas drops below a reference concentration. Boneberg, described above, merely describes that the anode and cathode exhaust gases flows to the mixing device 4 without being further controlled by an upstream valve. To cure this deficiency, the Office Action apparently relies on the valve 7 of Jörissen in combination with the mixing portion of Boneberg.

However, neither Boneberg nor Jörissen suggest or disclose the recited means for opening the valve if the concentration of hydrogen in the discharge hydrogen-off gas drops below a reference concentration. The Office Action asserts that this feature is taught by the programmable logic controller 14 which control the valve 7 based on at least a fuel cell voltage. The Office Action then asserts that factors such as concentration may be determined indirectly from at least the cell voltage.[13] Applicants respectfully disagree.

As Jörissen does not describe opening a valve based on concentration of hydrogen-off gas, Applicants presume that the Office Action is relying upon a theory of inherency. M.P.E.P. states "to establish inherency, the **extrinsic evidence** 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference.'"[14] Moreover, the mere fact that a certain thing **may result** from a given set of circumstances is

[13] See the Office Action mailed December 7, 2009, at page 9, lines 1-3.
[14] Quoting, *In re Robertson*, 169 F.2d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999), emphasis added.

not sufficient.[15] As applied to the present application, concentration of hydrogen in the discharge hydrogen-off gas is not necessarily determined by the fuel cell voltage. One of ordinary skill in the art will recognize that many factors affect fuel cell voltage including, but not limited to: temperature, humidity, impurities, damage to the fuel cell, concentration of oxygen in the cathode gas, pressure, etc. Accordingly, the extrinsic evidence does not make clear that the recited means for opening the valve (if the concentration of hydrogen in the discharged hydrogen drops below a reference concentration) is **necessarily present** in the apparatus described by Jörissen.

Based on the foregoing, even the combined teachings of Jörissen and Boneberg do not suggest or disclose all of the features of Claims 51 and 53. Moreover, the other cited references fail to cure the deficiencies of Jörissen and Boneberg. Applicants respectfully submit that Claims 51 and 53 are in condition for allowance.

As described above, Applicants respectfully submit that independent Claims 1, 8, and 51-53 are in condition for allowance. The dependent claims are respectfully submitted to be in condition for allowance for at least the same reasons as the independent claims from which they depend. Moreover, the dependent claims recite additional features not suggested or disclosed by the cited references.

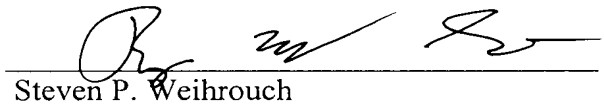
For the reasons discussed above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance for the pending claims is earnestly solicited.

[15] See also *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981), emphasis added.

Should Primary Examiner Hodge deem that any further action is necessary to place this application in even better condition for allowance, he is encouraged to contact Applicants' undersigned representative at the below-listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.



Steven P. Weihrouch
Attorney of Record
Registration No. 32,829

Ryan W. Smith
Registration No. 62,257

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 07/09)